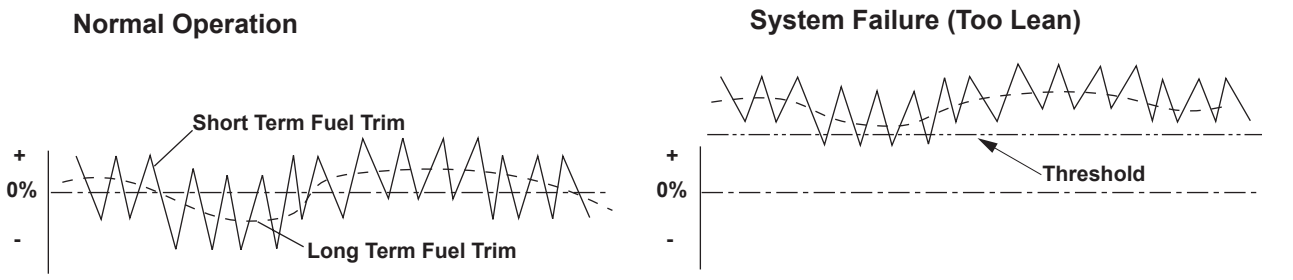
Advanced Diagnostics

DTC P0171: Fuel System Too Lean



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General Description

The powertrain control module (PCM) detects the oxygen content in the exhaust gas from the primary heated oxygen sensor (HO2S) (Sensor 1) signal voltage, and it performs fuel feedback control to maintain the optimal air/fuel ratio. The air/fuel ratio coefficient for correcting the amount of injected fuel is the short term fuel trim. The PCM varies short term fuel trim continuously to keep the air/fuel ratio close to the stoichiometric ratio for all driving conditions.
Long term fuel trim is computed from short term fuel trim and is used to regulate long term deviation from the stoichiometric air/fuel ratio, which occurs when fuel metering components deteriorate with age or system failures occur. In addition, long term fuel trim is stored in the PCM memory and is used to determine when fuel metering components malfunction. When long term fuel trim is higher than normal, which is about 1.0 (0%), the amount of injected fuel must be increased, and when lower than normal, it must be decreased. If long term fuel trim is higher than normal (too lean), a malfunction in the fuel metering components is detected and a DTC is stored.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Continuous
Sequence	None
Duration	—
DTC Type	Two drive cycles, MIL ON

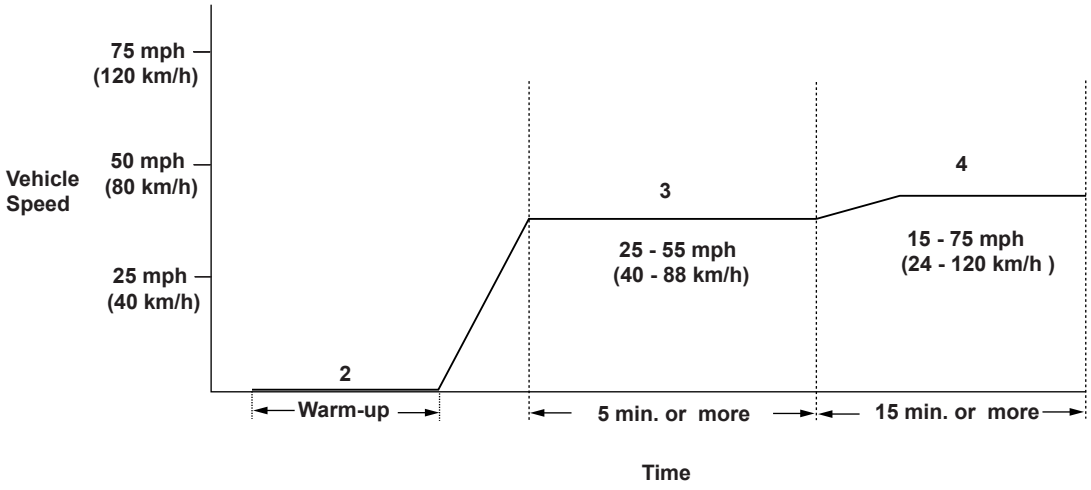
Enable Conditions

Condition	Minimum	Maximum
Engine coolant temperature	167ºF (75ºC)	212ºF (100ºC)
Intake air temperature	32ºF (0ºC)	187ºF (86ºC)
Engine speed	630 rpm	4,000 rpm
MAP value	28 kPa (210 mmHg, 8.3 in.Hg)	—
Vehicle speed	—	82 mph (132 km/h)
Fuel feedback	Closed loop	
Monitoring priority	EVAP, Catalyst System	
No active DTCs	PCM, Primary HO2S, Primary HO2S Heater, MAP, CKP, ECT, TP, CYP, IAT, EGR, BARO, VSS, VTEC System, Misfire	
Other	Other than when there is excessive vapor generation (fuel level is 40 - 80%)	

Malfunction Threshold

Long term fuel trim is higher than 1.19 (+19%).

Driving Pattern



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1. Connect a scan tool to the vehicle.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.
3. Drive at a speed between 25 - 55 mph (40 - 88 km/h) for at least 5 minutes.
4. Then, drive at a steady speed between 15 - 75 mph (24 - 120 km/h) for at least 15 minutes, and watch the long term fuel trim. If the long term fuel trim stays at about 1.0, the vehicle is OK or it is a very minor problem. If a significant fault is still present, the long term fuel trim will move up or down while driving.

- When freeze frame data is stored, drive the vehicle under those conditions instead of Driving Pattern 4.
- After clearing the DTC by disconnecting the battery or using the scan tool, drive at a speed between 25 - 55 mph (40 - 88 km/h) instead of Driving Pattern 3 for 40 minutes or longer to allow time for long term fuel trim to recover.
- If you have difficulty duplicating the DTC, retest after turning off electrical components such as the audio system and A/C, and try a different gear position.
- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive drive cycles in which the engine conditions are similar to the first time the malfunction was detected.

The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.